

AMENDMENTS TO THE CLAIMS

The following claims replace all prior versions and listings of claims in the application:

Claims 1 and 2 cancelled.

3. (Currently Amended) [The method of claim 1,] A method for defining tone signals in a voice activity detection (VAD) device, comprising:

defining a threshold for zero amplitude change by determining, for a signal with a zero value amplitude at a zero crossing point, a tangent value of the signal, and by defining the zero value amplitude as a non-zero value depending upon the tangent of said signal at the zero crossing point;

calculating a zero crossing rate of a signal;

extracting a set of parameters from a plurality of duration periods of said signal;

calculating a maximum difference between said plurality of duration periods; and

comparing said maximum difference with said threshold; and

declaring a sample of the signal as containing a tone when the maximum difference is not greater than the threshold;

wherein said defining comprises defining the threshold as one if the signal has no zero amplitude change, and defining the threshold as two if the signal has a zero amplitude change.

Claims 4-8 cancelled.

9. (Withdrawn) A device for defining tone signals for voice activity detection (VAD), comprising:

a processor that is programmed to:

determine, for a signal with a zero value amplitude at a zero crossing point, a tangent value of the signal; and

define the zero value amplitude as a non-zero value depending upon the tangent of said signal at the zero crossing point; and

calculate a zero crossing rate of the signal.

Claim 10 (cancelled) .

11. (Withdrawn) The device of claim 10, wherein said processor defines said zero value amplitude according to whether said tangent is positive or negative.

Claim 12 (cancelled).

13. (Withdrawn) The device of claim 9, wherein the processor incorporates the zero crossing rate into a decision of whether the incoming signal contains a tone.

Claim 14 (cancelled).

15. (Withdrawn) The device of claim 9, wherein the device defines tone signals

according to an International Telecommunications Union (ITU) recommendation G.729 Annex B VAD recommendation.

Claim 16 (cancelled).

17. (Currently Amended) [The method of claim 1,] A method for defining tone signals in a voice activity detection (VAD) device, comprising:

defining a threshold for zero amplitude change by determining, for a signal with a zero value amplitude at a zero crossing point, a tangent value of the signal, and by defining the zero value amplitude as a non-zero value depending upon the tangent of said signal at the zero crossing point;

calculating a zero crossing rate of a signal;

extracting a set of parameters from a plurality of duration periods of said signal;

calculating a maximum difference between said plurality of duration periods; and

comparing said maximum difference with said threshold; and

declaring a sample of the signal as containing a tone when the maximum difference is not greater than the threshold;

wherein the calculating the zero crossing rate comprises:

analyzing the sample to determine if an amplitude of a signal sample is zero at a zero crossing point;

when the amplitude is zero at the zero crossing point, determining a tangent of a

signal wave of the signal sample at the zero crossing point;

changing the signal amplitude from zero to negative one if the tangent is negative; and

changing the signal amplitude from zero to positive one if the tangent is positive.

Claims 18 and 19 cancelled.

20. (Currently Amended) [The method of claim 4, further comprising:] A device for defining tone signals for voice activity detection (VAD), comprising:

a processor that is programmed to:

define a threshold for zero amplitude change;

calculate a zero crossing rate of a signal;

extract a set of parameters from a plurality of duration periods of said signal;

calculate a maximum difference between said plurality of duration periods; and

compare said maximum difference with said threshold

calculating a zero crossing rate wherein the signal has a zero amplitude change at a zero crossing by:

analyzing the sample to determine if an amplitude of a signal sample is zero at a zero crossing point;

when the amplitude is zero at the zero crossing point, determining a tangent of a signal wave of the signal sample at the zero crossing point;

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changing the signal amplitude from zero to negative one if the tangent is negative; and

changing the signal amplitude from zero to positive one if the tangent is positive.